```
admin> set silence-det-cng = no

admin> write
VOIP/{ 0 0 } written
```

SNMP: Support for the VoIP MIB (ascend 28)

The VoIP MIB enables network management stations to monitor MultiVoice Gateway operations using SNMP. Attributes in the MIB can be obtained by SNMP Get and Get-Next operations. The MIB uses the following object identifiers for identifying MultiVoice Gateway or Gatekeepers to a network manager:

- voipCfgGroup (voipGroup 1)
- voipCfgGkGroup (voipCfgGroup 1)
- voipCfgGwGroup (voipCfgGroup 2)

The MIB uses the following tables for identifying MultiVoice Gatekeeper and Gateway functions.

```
voipCfgGkTable OBJECT-TYPE (voipCfgGkGroup 1)
   SYNTAX SEQUENCE OF VoipCfgGkEntry
   ACCESS not-accessible
   STATUS mandatory
   DESCRIPTION A list of entries for H323 network Gatekeeper.

voipCfgGkEntry OBJECT-TYPE (voipCfgGkTable 1)
   SYNTAX VoipCfgGkEntry
   ACCESS not-accessible
   STATUS mandatory
   DESCRIPTION An entry holding information about the Gatekeeper for
   the system.
   INDEX (voipCfgGkIndex)

VoipCfgGkEntry:
   SEQUENCE :
      voipCfgGkIndex-INTEGER
      voipCfgGkStatus-INTEGER
      voipCfgGkIpAddress-IpAddress)

voipCfgGkIndex OBJECT-TYPE ( voipCfgGkEntry 1)
   SYNTAX INTEGER
   ACCESS read-only
   STATUS mandatory
   DESCRIPTION This number uniquely identifies the Gatekeeper.

voipCfgGkStatus OBJECT-TYPE (voipCfgGkEntry 2)
   SYNTAX INTEGER:
      registered(1)
      not_registered(2)
   ACCESS read-only
   STATUS mandatory
   DESCRIPTION This value indicates whether the gateway is registered
   with the Gatekeeper.

voipCfgGkIpAddress OBJECT-TYPE (voipCfgGkEntry 3)
   SYNTAX IpAddress
   ACCESS read-only
   STATUS mandatory
   DESCRIPTION The IP address of the Gatekeeper.
```

```
voipCfgGwVpnMode OBJECT-TYPE (voipCfgGwGroup 1)
   SYNTAX INTEGER:
      no (1)
      yes(2)
   ACCESS read-only
   STATUS mandatory
   DESCRIPTION Virtual Private Network Toggle Switch.
voipCfgGwPktAudioMode OBJECT-TYPE (voipCfgGwGroup 2)
   SYNTAX INTEGER:
      other(1)
      g711_ulaw(2)
      g711_alaw(3)
      g723(4)
      g729(5)
      g723_6_4kps(6)
   ACCESS read-only
   STATUS mandatory
   DESCRIPTION Audio Coder to be used for voice packetization.
```

The `voipCfgGwVpnMode` and `voipCfgGwPktAudioMode` objects can be accessed using index 0 because they are separate leaves in the MIB tree.

The `voipCfgGkIndex`, `voipCfgGkCurrent` and `voipCfgGkIpAddress` objects are located in the `voipCfgGkTable` table. They can be obtained using `voipCfgGkIndex` as an index.

SNMP: Traps for VoIP-related conditions

With MAX TNT TAOS 8.0.1, VoIP-enabled MAX TNT units can generate traps for the following MultiVoice Gateway events:

- Change in the call logging server
- Change in configured Gatekeeper for VoIP
- Change in state of a WAN line

For the traps to be sent, traps must be enabled in the system and the individual trap conditions must be set to `yes`. For details about enabling traps, see the *MAX TNT Administration Guide*. Following are the relevant parameters (shown with default values) for enabling the individual trap conditions:

```
[in TRAP/""]
call-log-serv-change-enabled = no
voip-gk-change-enabled = no
wan-line-state-change-enabled = no
```

Parameter	Specifies
Call-Log-Serv-Change-Enabled	Enable/disable trap generation when the call-logging server changes. If the call-logging server index is changed or if the IP address of the active call-logging server is changed, this trap sends the following information to the SNMP manager: • The new call logging server index (callLoggingServerIndex) • The IP address of new call logging server (callLoggingServerIPAddress) • The absolute time to show when the server change occurred (sysAbsoluteCurrentTime) (Ascend Trap 38)
Voip-GK-Change-Enabled	Enable/disable trap generation when the registered Gatekeeper changes. If a new Gatekeeper is registered with the Gateway, a register request (RRQ) message is sent from the Gateway to the new Gatekeeper. When the Gateway receives the admission request (ARQ) message from the new Gatekeeper, this trap sends the following information to the SNMP manager: • The new Gatekeeper index (voipCfgGkIndex) • The IP address of new Gatekeeper (voipCfgGkIpAddress) • The absolute time to show when the Gatekeeper change occurred (sysAbsoluteCurrentTime) (Ascend Trap 39)
WAN-Line-State-Change-Enabled	Enable/disable trap generation if the state of an E1 or T1 line changes. This trap sends the following information to the SNMP manager: • The T1 or E1 line interface index (wanLineIfInde) • The line usage (wanLineUsage). This usage is reported as `trunk`, `quiesced`, or `disabled`. • The absolute time to show when the line state changed (sysAbsoluteCurrentTime) (Ascend Trap 40)

NavisAccess support for VoIP call reporting

MAX TNT TAOS 8.0.1 supports basic VoIP call reporting using NavisAccess. This includes the capability to generate Start records, Stop records, and Call Progress records for both VoIP and fax calls. These records allow NavisAccess to monitor Gateway resource usage and provide information to create billing records. Each VoIP call can generate two or more records.

Start records

A Start record reports the point in the call where a speech communications is established. Start records can provide the following information:

Attribute	Specifies
Ascend-Call-Direction	Direction of the call between the Gateway and PSTN. The reported values are Ascend-Call-Direction-Incoming (0) and Ascend-Call-Direction-Outgoing (1). (Ascend Trap 48)
NAS-Port	Encoded NAS port used for this call. (RFC Trap 5)

Attribute	Specifies
NAS-Port-Type	Encoded NAS port used for this call. The value 7 for this attribute identifies a VoIP call. (RFC Trap 61)
NAS-IP-Address	NAS IP address associated with this call. (RFC Trap 4)
Session-Id	NAS session index recorded in the session table for this call. (RFC Trap 44)
Ascend-Modem-PortNo	DSP/modem port allocated for processing this call. This value is part of the resource count information, and is repeated each time it is allocated for a call. (Ascend Trap 120)
Ascend-Modem-SlotNo	Slot where the DSP/modem card associated with the reported Ascend-Modem-PortNo is located. This value is part of the resource count information, and is repeated each time it is allocated for a call. (Ascend Trap 121)
Ascend-Modem-ShelfNo	Shelf where DSP/modem card allocated for processing this call is installed. This is part of the resource count information, and is repeated each time it is allocated for a call. (Ascend Trap 122)
Called-Station-Id (DNIS)	Dialed number string reported by the Gateway for the called destination. (RFC Trap 30)
Ascend-Dialed-Number	Dialed number string used by the Gateway to complete the call. (Ascend Trap 24)
Service-Type	Requested type of service, the value of the Type of Service byte, for this call. (RFC Trap 6)
Ascend-H323-Destination-NAS-ID	NAS IP address used to route the call to the connecting Gateway. (Ascend Trap 22)
Ascend-H323-Gatekeeper-IP	IP address of the Gatekeeper used to route the call. The Gateway is registered with this Gatekeeper. (Ascend Trap 19)
Ascend-Global-Call-Id	IP address used by the Gatekeeper to identify the connecting Gateway for this call. (Ascend Trap 20)
Ascend-H323-Conference-ID	IP address used to identify the called destination. (Ascend Trap 21)
Ascend-H323-Presession-Time	Time from the moment the caller finishes dialing the destination telephone number until the moment the speech path is established to the called destination. (Ascend Trap 198)
Ascend-H323-Dialed-Time	Time the user spends dialing the destination telephone number. This value will be zero for call originating from the LAN. (Ascend Trap 23)
Ascend-Session-Type	Audio codec used for processing the call. (Ascend Trap 18)

Stop records

A Stop record is generated at the moment when MultiVoice begins to tear down the speech path or when an incoming call to a Gateway fails to connect. A Start record can contain following information:

Attribute	Specifies
Acct-Session-Time	Time from the moment the speech path is established to the called destination until the moment MultiVoice begins to tear down the speech path. (RFC Trap 46)
Ascend-Connect-Progress	A number that represents the call connect state at the time the call was terminated. (Ascend Trap 195)
Ascend-Disconnect-Cause	A number that reports the H.323 call disconnection reason. (Ascend Trap 196)
Ascend-H323-Inter-Arrival-Jitter	Estimated interarrival jitter for voice packets received by a Gateway. (Ascend Trap 25)
Ascend-Dropped-Octets	The number of voice frames (in bytes) dropped by a Gateway during call processing. (Ascend Trap 26)
Ascend-Dropped-Packets	Number of voice packets dropped by a Gateway during call processing. (Ascend Trap 26)
Acct-Input-Octets	Number of voice frames (in bytes) received by a Gateway during this call. (RFC Trap 42)
Acct-Input-Packets	Number of voice packets received by a Gateway during this call. (RFC Trap 47)
Acct-Output-Octets	Number of voice frames (in bytes) sent by a Gateway during this call. (RFC Trap 43)
Acct-Output-Packets	Number of voice packets sent by a Gateway during this call. (RFC Trap 48)

Call Progress records

A Call Progress record can be generated during a VoIP call when a change in resource occurs for a fax or transparent modem call. For fax calls, this record includes the modem speed and modulation. A progress message contains all the information included in a Start record.

EXHIBIT 11

Jeff Saltzberg

From: Shoeb Siraj [shoeb.siraj@mci.com]
Sent: Wednesday, February 09, 2005 7:17 AM
To: 'Jeff Saltzberg'
Cc: Nancy.S.McCarty@mci.com; John.Anderson@mci.com
Subject: FW: DAN Platform

Jeff:

Response from the Director of Engineering at Lucent.

Thanks,

~Shoeb.

-----Original Message-----
From: Don Krause [mailto:dk@lucent.com]
Sent: February 08, 2005
To: Shoeb Siraj
Subject: RE: DAN Platform

Hi Shoeb,

I'm having a hard time finding any Marketing literature on the CSM cards. This literature would have been generated in the 1999-2000 timeframe and it no longer seems to be available.

Nonetheless, the two modem cards are Conexant based modem cards. Support for these cards ends with 10.1. They support modem protocols up to and including V.90, but do not support V.92. Voice is not supported on either of these cards.

The HDLC card terminates HDLC sessions over ISDN calls. In addition, it can be used in Frame Relay applications. This card is still supported. Please refer to our release notes for the details on the applications of these cards.

Release notes can be found at:

http://www.lucent.com/products/relmatlisting/comp/listing/1,,SOID+1334-LOCL+1-DOC_ID+111-PNUM+1-PGID+0-ORIG+s,00.html

Thanks, Don

Don Krause Lucent Technologies http://www.lucent.com/ins
mailto:dk@lucent.com Voice: 510.747.6793 FAX: 510.747.5411
Mobile: 510.552.6573 Pager: mailto:5105526573@vtext.com

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EXHIBIT 12

Lucent Technologies
Bell Labs Innovations

Frequently Asked Questions
TAOS 9.0 for MultiVoice™

1. ***What is the True Access Operating System (TAOS)?***

   The True Access™ Operating System (TAOS) from Lucent Technologies is the multiservice, real-time operating system software embedded in the APX 8000™, Stinger™, MAX TNT®, MAX™, SuperPipe, and Pipeline® family of access platforms. TAOS provides the widest range of solutions for WAN access environments and represents the brand name for the leading WAN access feature set for service providers and corporate enterprises. TAOS underlines the Lucent heritage in WAN access solutions and its commitment to research and development to ensure continued leadership in the market.

2. ***What edge access platforms does TAOS 9.0 for MultiVoice support?***

   TAOS 9.0 for MultiVoice™ supports the following industry-leading access platforms:

   APX 8000, MAX TNT, and MAX 6000. Lucent plans to support the MAX 3000 and SuperPipe Plus in the second quarter of 2001 in TAOS version 9.1.

3. ***What are the major features within TAOS 9.0 for MultiVoice?***

   TAOS 9.0 for MultiVoice is a major release that enables "Universal Port" capabilities on the APX 8000 and MAX TNT platforms. Universal Port supports multiple applications including simultaneous analog and digital modems for remote access, voice- and fax-over-IP, and virtual private networks (VPNs) using any available port processor resources on the 96- or 48-port MultiDSP modules.

   Specific MultiVoice features include application support for residential 1+ long distance (LD) and 1010 dial-around services, and call routing programmability in and out of the voice-over-IP (VoIP) network based on dialed number identification service (DNIS) or trunk group. In 2-stage dialing scenarios (calling card), you can implement programmability for authentication and routing based on Automatic Number Identification (ANI), DNIS, trunk group, and/or password. Other features include custom branding (announcements), arbitrary break-in announcements, sequential dialing, and support for operator assistance/calling card balance recharge. **Please note that 1+ LD and 1010 dial-around services require Feature Group D support that is available only in North America and other select regions.**

4. ***What is "Universal Port"?***

   "Universal Port" functionality enables the MAX TNT and APX 8000 platforms to configure the digital signal processor (DSP) automatically for the type of incoming call—dial-up (V.90 modem or ISDN), VoIP, fax-over-IP, and virtual private network (VPN)— accommodate it on any available port, and process it for transport over a packet-based IP network. **Please note that "Universal Port" is not supported on the MAX 6000 or MAX 3000 at this time.**

5. ***Which slot cards support "Universal Port" with the MAX TNT and APX 8000 platforms?***

   The 48-port MultiDSP slot card(s), and the 96-port MultiDSP card(s) are needed to support the "Universal Port" feature. Part numbers are as follows:

   - 48-port MultiDSP cards (TNTV-SL-ADI-C)
   - 96-port MultiDSP cards (APX8-SL-96DSP)

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6. ***Can the same chassis house the 48-port MultiDSP and 96-port MultiDSP slot cards?***

As of TAOS 9.0, you may mix the 48- and 96-port MultiDSP cards in a single chassis for data applications only—that is, you can mix them for V.90, ISDN, VPN, etc., but not when running a VoIP service at this time.

7. ***Are there any limitations of the 96-port MultiDSP vs. the 48-port MultiDSP?***

Yes, the 96-port MultiDSP card can be used as a modem or a voice coder. This card supports G.711 and G.729 (a) only. In addition, every port can support fax-over-IP, either as transparent fax transport (carried as G.711 PCM with no echo cancellation) or fax relay (T.38 based). The 48-port MultiDSP card supports analog and digital modems, fax-over-IP, and all supported MultiVoice codecs including G.711, G.729a, G.723.1, G.728, and RT-24.

8. ***How do I upgrade TAOS on an existing MAX TNT or APX 8000 platform with MultiVoice hash code? Is there a charge to obtain the software?***

The software is free to existing MultiVoice customers. To obtain the software and release information, go to the following URLs:

MAX TNT: ftp://ftp.ascend.com/pub/Software-Releases/MaxTNT/
APX 8000: ftp://ftp.ascend.com/pub/Software-Releases/APX/

7. ***Can I upgrade my existing remote access concentrator for the MAX TNT and APX 8000 platforms to support MultiVoice TAOS 9.0 with "Universal Port?" and is there a cost?***

Yes, you need the following components to create and contribute to the programmability of the MultiVoice with the "Universal Port" solution:

- MultiVoice Hash Code
- MultiVoice Access Manager 3.1 (MVAM 3.1) or Lucent Softswitch 3.0
- Lucent Worldwide Services for MultiVoice Networks
- Add-on applications from Lucent or a MultiVoice approved third-party vendor (see http://www.lucent.com/ins/map) *(Optional)*
- MultiVoice Settlement Engine 1.0 *(Optional)*
- Either 48- or 96-port MultiDSP cards to support VoIP, fax-over-IP, and all data applications.

You are also required to install the Feature Group D hash code option on each gateway that will support interexchange carrier (IXC) traffic in a MultiVoice network using the MultiVoice Access Manager 3.1 as the gatekeeper.

The Lucent sales force and technical support teams are available to answer questions and assist you with information and pricing regarding your existing network and business needs. For additional support, you may also contact certified Lucent distributors and system integrators directly or go to the Lucent Web site at (http://www.lucent.com/ins/products/multivoice) for more information on the MultiVoice for the MAX product.

10. ***If I decide not to upgrade to TAOS 9.0, will Lucent still support the older versions of TAOS?***

Yes, but you should consider upgrading to version 9.0 for its enhanced features, performance and functionality—and it is FREE!

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11. What are the benefits of TAOS 9.0 for MultiVoice?

The "Universal Port" feature uses the same DSP for voice or data on a call-by-call basis, which allows you to use the APX 8000 and MAX TNT products as multiservice platforms. Lucent is the first to offer Universal Port capability on platforms with multiple DS3 capacity. Multiservice networks provide the key to reduced costs, and are targeted to provide network service providers with a common platform that they can use for transparent integration of voice, fax, and modem services in an existing or new carrier infrastructure.

Other benefits include the ability to sell multiservice capability on a single platform into lucrative calling card, dial-around, and long distance markets. MultiVoice can now be deployed— where, until now, a Class 4 tandem switch was required—to trunk long-distance (LD) calls in intra-LATA or interLATA switching environments. Supported applications include residential 1+ LD and 1010 dial-around services. This new MultiVoice functionality enables any Internet service provider (ISP) to offer telephony services in the $87 billion North American market for long-distance services.

12. When will TAOS 9.0 be available?

TAOS 9.0 is available now. You can download the software from the following URLs:

MAX TNT: ftp://ftp.ascend.com/pub/Software-Releases/MaxTNT/
APX 8000: ftp://ftp.ascend.com/pub/Software-Releases/APX/

13. Does TAOS 9.0 for MultiVoice operate with Lucent Softswitch and what type of applications does it support?

Yes, TAOS 9.0 does interoperate with Lucent Softswitch 2.x, 3.0, and above.

The initial application of Lucent Softswitch 3.0 is to replace the toll/tandem (class-4) switches and to offer VoIP connectivity. Lucent Softswitch controls trunking gateways like the MAX-TNT and APX-8000, which convert circuit trunks to VoIP packets. Lucent Softswitch receives the SS7 signaling from the PSTN by an embedded SS7-Gateway and performs call control functions. This solution allows operators to replace existing toll/tandem exchanges with a Lucent Softswitch + gateway combination distributed in a network. Being a flexible signaling infrastructure, Lucent Softswitch offers voice over packet connectivity with a variety of technologies.

Another application includes Internet Call Diversion (ICD) which diverts Internet dial-up data traffic directly to the data packet network to alleviate congestion on the circuit based PSTN. This application has been the driving force behind the evolution of gateways we know today and has accelerated the clarification of the Lucent Softswitch architecture by separating payload and call-control. For further information on Lucent's Softswitch product go to

http://www.lucent-ssg.com/ons/softswitch/

Does NavisAccess™ v5.0 support TAOS 9.0 for MultiVoice?

Yes, with Navis™ 5.0 and MultiVoice, you can use the VoIP gateway Management Information Base and call logging to manage the VoIP network and application. You can map VoIP calls based on DNIS and Trunk Group and monitor VoIP services in real-time using NAVIS AccessWatch. You can also monitor physical resources including DSPs, slot cards, and modems and base fault, performance and event monitoring on VoIP statistics—jitter, delay/latency, and call rates. You can purchase the NavisAccess management platform separately.

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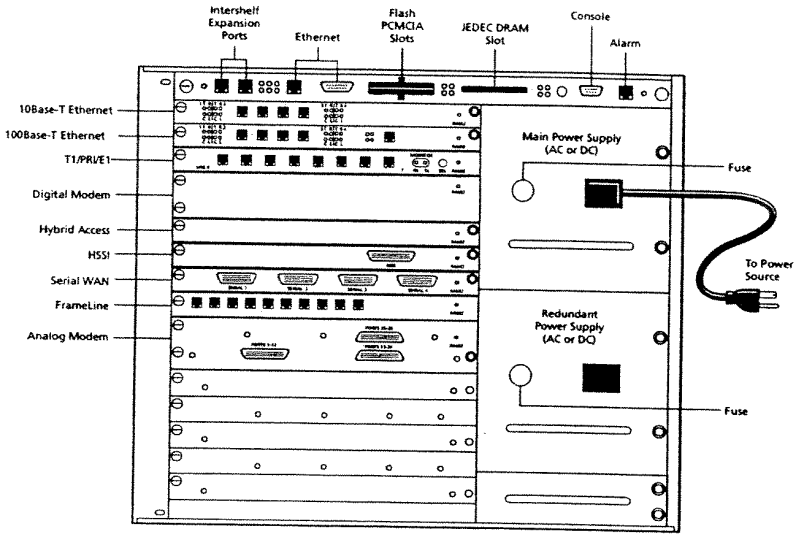
14. How can I purchase the TAOS 9.0 and where can I get additional information?

You may purchase the MultiVoice TAOS 9.0 for the APX 8000 and MAX TNT platforms via the standard MAX distribution channels including the following:

- Distributors
- Value-added reseller (VAR) channels
- Direct from Lucent

For more information, please call Lucent in the U.S. at 1.800.621.9578 or visit our Web site at http://www.lucent.com/ins/products/multivoice.

MAX TNT Back Panel Options



Hardware Specifications

Height
14 in. x 17.4 in. x 11.5 in.
(35.6 cm x 44.2 cm x 29.2 cm)

Weight
130 lbs., with 672 modems (single power supply)
27.2 lbs. empty (no power supplies)

LAN Interface
Ethernet 10 BaseT, 100 BaseT

WAN Interfaces
DS3, T1/E1, Serial (V.35, RS449, X.21)
ATM DS3, STM-0 for Japan only

Software Upgrade
Via built-in flash RAM, remote downloadable

Power Requirements
950 watts, 47-63 Hz, 90-240 VAC, -40 to -60 VDC

Operating Requirements
Temperature:
32-104°F (0-40°C)

Altitude:
0-14,800 ft. (0-4500 meters)

Relative Humidity:
0-90% (noncondensing)

Safety Certifications
CSA 950, NTRL/UL 1950,
TUV EN 60 950
EMI/RF
FCC Part 68, FCC Part 15, E55081-1, N50082-1, EN55022

Software Specifications

Network Protocols Supported
TCP/IP

Routing Protocols Supported
RIP, RIP2, OSPF, IGMP multicast forwarding

LAN Protocols Supported
Ethernet 10 BaseT, 100 BaseT

WAN Protocols Supported
PPP, ARAP, SLIP, C-SLIP, Async PPP, Sync PPP, HDLC, ARA, X.25 PAD, X.25 over B-channel, V.120, D4 framing (T1/E1), G703/732 framing (R1), R2, frame relay PVC, Hybrid Access, PPP-FR gateway, FR NNI, ATM (UNI and NNI)

VoIP Protocols Supported
H.323, IPDC

Modem
V.90, K56flex, V.34, MNP5, V.42bis, fax modem send up to 14.4 Kbps

Bandwidth Management
Multilink PPP, Multilink Protocol Plus, TCP header compression, data compression Lucent /Microsoft/STAC V9)

Security
Lucent NavisRadius, PAP, CHAP, token card, CLID, packet filtering, SNMP, console management (VT-100), PPP callback, user authentication

Management
NavisAccess network management, console management software (runs on Windows 95 and Windows 3.x) Telnet, NASI, SNMP II, PPP LQM, frame relay ITU Annex A, frame relay ANSI

Annex D

Client Software

IntragyAccess software

DeskDial client software

To learn more, contact your Lucent Technologies Representative, Authorized Reseller, or Sales Agent. Or, visit our Web site. www.lucent.com

Specifications subject to change without notice.

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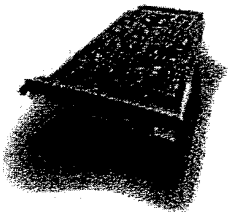
EXHIBIT 13

PP

Total Control Platform with HiPer Access System Card Sets

HiPer DSP Card Set

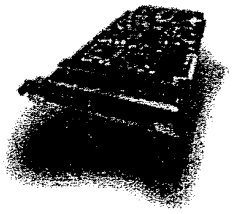


The advanced design of the HiPer DSP card set enables multiple modem sessions, ISDN processing, voice-codecs, and PPP co-processing on a single DSP (digital signal processor)—delivering a high level of functionality in a small space. The card set can process a T1/E1 span's worth of channels (24 or 30 channels respectively) while occupying just one platform slot.

In a fully populated Total Control platform, the HiPer DSP card set can handle up to 336 calls via T1 and up to 420 calls via E1.

Unlike a simple modem card, the HiPer DSP card set features a fully reprogrammable digital signal processing engine that lets administrators reconfigure the system to implement new technologies and applications such as voice-over-IP. The card set supports a full range of trunk and communications standards, including many variations of CAS/PRI 56K V.90*, 3Com x2*** technology, and all of the most common ITU-T and Bell communications standards and rates (including V.34, V.32terbo, V.32, and V.32bis, H.323-RTP and G.7231.1)

HiPer Access Router Card Set



The HiPer access router card set works with the HiPer DSP card set to process the packet content of digital and analog connections and route user data, at wire speeds, to various LAN/WAN interfaces.

The HiPer access router supports a broad set of LAN and WAN protocols and provides full access routing functionality, including per-user firewalls with application and protocol filtering. STAC compression, RIP and RIP Version 2, plus RADIUS and other user authentication support.

Occupying one slot each, two HiPer access router card sets can be configured to provide load sharing and redundancy for increased access router performance. Support for SNMP management, call activity logging and RADIUS accounting ensure a high level of oversight and control over network access activities.

Key Benefits

Industry leading call capacity ensures the best price/performance in the smallest footprint.

Flexible hardware and software architecture supports multiple services based on software re-configuration.

State-of-the-art RISC processors and distributed protocol support offers industry leading performance even under extreme network loading.

Specifications

Total Control Multiservice Access Platform

HiPer Access Router System

Power Requirements

Example of a Fully Loaded System: 96A max.

- 14 HiPer DSP NIC/NAC sets
- 2 HiPer access router NIC/NAC sets
- 1 Network Management NIC/NAC set

HiPer DSP NIC/NAC set: 5.4A max.

HiPer access router NIC/Ethernet NAC set: 7.0A max.

EdgeServer Pro card: 15A max

Network Management card: 5.0A max.

Physical Dimensions

Total Control Platform

Height: 8.75 in/ 22.2 cm

Width: 17.3 in/ 43.6 cm

Depth: 18.6 in/ 47.2 cm

Operating Environment

Temperature: 30°–104°F (0°–40°C)

Humidity: 0-95% noncondensing

Regulatory/Agency Approvals

Complies with FCC Part 15, Class A requirements for Radiated and Powerline Conducted Emissions

FCC Part 68 approved

NEBS Level 3 support

UL and C-UL (CSA equivalent) Listed under UL 1950, Information Technology Equipment

CE

HiPer DSP Card Set

Physical Interfaces

T1/T1-PRI and E1/E1-PRI:

One RJ-45 T1/E1 port

One RJ-45 RS-232-emulated connector for local management console

One Dual 1/8 in. bantam monitor jack (T1 version only)

Power Requirements

T1 NIC + 24 channel HiPer DSP NAC: 4.8A typical (24W)

E1 NIC + 30 channel HiPer DSP NAC: 5.2A typical (26W)

Primary Rate Interface Compliance

Compliant with AT&T technical publication TR41459 and compatible with AT&T ISDN PRI services

Laboratory Testing

ISDN data link layer ITU-T Q.921

ISDN call control signaling ITU-T Q931/I.451

Provides ANI and DNIS digits via Q.931 D-channel signaling

Supports Nonfacility Associated Signaling (NFAS) with D-channel backup

E&M Type II Signaling (T1 Interfaces)

Channelized T1 robbed bit signaling

Loop Start

Ground Start

E&M wink start

E&M immediate

E&M FGD

E&M FGB

T1 CR22

Central Office Switch Signaling Support (ISDN)

AT&T 4ESS Custom

AT&T 5ESS Custom

Northern Telecom DMS-100 Standard

Northern Telecom DMS-250

INS 1500

ER11

National ISDN 2 (NI2)

Digital Data Compatibility

For end-to-end transmission over ISDN: Sync PPP, ITU-T V.120/I.462, ITU-T V.110/I.463, 64 Kbps and 56 Kbps clear channel HDLC, X.75

T1/E1 Interface

Metallic interface per ANSI T1.403

CSU to T1 per AT&T Pub 62411

PRI interface per ANSI T1.408

D4 or ESF frame formats

B8ZS line coding

Auto equalization for data and clock recovery (36dB)

Supports local and remote loopbacks

E1 Interface

Metallic interface per ITU-T G.703

PRI interface per ETS 300 011

HDB3 line coding

ITU-T G.704 framing with and without CRC-4

Modulation Support

V.90 (56 Kbps*)

x2 (56 Kbps*)

V.34 (33.6 and 28.8 Kbps)

V.32terbo (19.2 Kbps)

V.32 (9600 and 4800 bps)

V.32bis (14.4 Kbps, 12 Kbps, 9600 bps, 7200 bps and 4800 bps)

V.22 (1200 bps)

V.22bis (2400 bps)

V.25

Bell 212A (1200 bps)

Bell 103

Error Correction

ITU-T V.42

MNP 2-4

Data Compression

ITU-T V.42bis

MNP 5

Voice Over IP (optional) CODEC Support

Line Echo Cancellation

ITU G.723.1

ITU-6.165

Protocols

ITU H.323

RTP

PPP

HiPer Access Router Card Set

Physical Interfaces

Dual, auto-sensing 10/100 Ethernet interfaces

Two RJ-45 10BASE-T/100BASE-T

One RJ-45 RS-232-emulated connector for local management console

Power Requirements

10/100 Ethernet NIC + HiPer access router NAC: 6.2A typical (31W)

Client Dial-Up Support

PPP with automatic PPP detection

SLIP, CSLIP

Telnet

DHCP

Rlogin

STAC compression

IP address pooling

Routing Support

RIP version 2

Transparent on-demand routing

IP protocol routing

Support for host, subnet, and network routers

Administration

Local flash ROM for booting and configuration storage

Support for Domain Name Service (DNS)

Call activity logging

SNMP management; MIB II and additional MIBs

Telnet command line interface

Ping utilities

Dial-in administrative access

RADIUS accounting

Filtering and Security

IP protocol filtering

Set inbound and outbound packet filtering independently

Compatible with RADIUS authentication servers

IP address assignment per router or per port

PPP Specific Features

STAC Data Compression for PPP payload

Address and control field compression

PAP and CHAP authentication protocols

Magic number loopback detection

Maximum receive unit negotiation

Async control character map negotiation

IP address negotiation and assignment

Van Jacobson compression TCP/IP headers

Industry Standards Support

ARP (Address Resolution Protocol)

CCP (compressed PPP) with support for STAC algorithms

CSLIP (compressed SLIP)

ICMP (Internet Control Message Protocol)

IP (Internet Protocol)

PPP (Point-to-Point Protocol)

RFC 1331, 1332, and 1334 for PPP

RIP (Routing Information Protocol) and RIP Version 2 with optional authentication

SLIP (Serial Line Internet Protocol)

TCP (Transmission Control Protocol)

Telnet

UDP (User Datagram Protocol)

CIDR

EdgeServer Pro Card

System Requirements

HiPer DSP card set, or Dual T1, E1, or PRI card set with Quad V.34 Modem cards

Power Requirements

15A max

Hardware Set

EdgeServer Pro NAC card (occupies 3 slots)

One or two** Intel® 200 MHz Pentium® Pro processors with 256 KB L2 cache

Two 2 GB internal mode 4 EIDE hard drives

Four ECC memory DIMM sites supporting up to 1 GB of memory. Four DIMMs may be installed in any combination in the following sizes: 64 MB, 128 MB, 256 MB

One 3.5" 1.44 MB floppy disk drive

Reset/Reboot button

EdgeServer Pro Peripheral NIC Card

Ultra-wide SCSI-3 interface

DB-15 SVGA video

Mini-DIN keyboard connector

Mini-DIN mouse connector

Optional Ethernet NIC Card

Two 10/100 Ethernet RJ-45 autosensing ports

One RJ-45 RS-232 serial port

EMI/EMC Regulatory

FCC Part 15, Class A; EN 55082; EN 55022, Class A

Safety

UL 1950; EN 60950; C-UL; CE-MARK

EdgeServer Operating System

Optional factory installed Windows NT Server 4.0

Server license and five client licenses

CD media

Getting Started documentation

Quad Modem Card

DTE Interface

Supports standard DTE rates up to 115,200 bps

Asynchronous operation

Synchronous operation (DCE supplies TxD clock)

Physical interface 1 SCSI-II 50-pin connector (converted via supplied cable to 4 EIA RS-232 25-pin female)

Error Correction

ITU-T V.42

MNP 2-4

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S 1671

3Com Total Control

Total Control Multiservice Access Platform

3Com Corporation
P.O. Box 58145
400 Bayfront Plaza
Santa Clara, CA 95052-8145
Phone: 1 800 NET 3Com
or 1 408 326 5000
Fax: 1 408 326 5001
World Wide Web:
www.3com.com

Asia Pacific Rim
Sydney, Australia: 61 2 9937 5000
Melbourne, Australia:
61 3 9866 8022
Beijing, China: 86 10 68492 568
Shanghai, China: 86 21 6350 1581
Hong Kong: 852 2501 1111
India: 91 11 644 3974
Indonesia: 62 21 572 2088
Osaka, Japan: 81 6 536 3303
Tokyo, Japan: 81 3 5977 3266
Korea: 82 2 3455 6300
Malaysia: 60 3 715 1333
New Zealand: 64 9 366 9138
Philippines: 632 892 4476
Singapore: 65 538 9368
Taiwan: 886 2 2 377 5850
Thailand: 662 231 8151 5

3Com Austria
43 1 580 17 0

3Com Benelux B.V.
Belgium: 32 2 725 0202
Netherlands: 31 346 58 62 11

3Com Canada
Calgary: 1 403 265 3266
Edmonton: 1 403 423 3266
Montreal: 1 514 683 3266
Ottawa: 1 613 566 7055
Toronto: 1 416 498 3266
Vancouver: 1 604 434 3266

3Com Eastern Europe/CIS
Bulgaria: 359 2 962 5222
Czech/Slovak Republics:
420 2 21845 800
Hungary: 36 1 250 83 41
Poland: 48 22 6451351
Russia: 7 095 258 09 40

3Com France
33 1 69 86 68 00
Carrier and Client Access:
33 1 41 97 46 00

3Com GmbH
Berlin, Germany: 49 30 3498790
Munich, Germany: 49 89 627320

3Com Iberia
Portugal: 351 1 3404505
Spain: 34 1 509 69 00

3Com Latin America
U.S. Headquarters: 1 408 326 2093
Miami, Florida: 1 305 261 3266
Argentina: 54 1 312 3266
Brazil: 55 11 246 5001
Chile (also serving Bolivia and Peru):
56 2 633 9242
Colombia: 57 1 629 4847
Mexico: 52 5 520 7841/7847
Peru: 51 1 221 5399
Venezuela: 58 2 953 8122

3Com Mediterraneo
Milan, Italy: 39 2 253011
Rome, Italy: 39 6 5279941

3Com Middle East
971 4 319533

3Com Nordic AB
Denmark: 45 48 10 50 00
Finland: 358 9 435 420 67
Norway: 47 22 58 47 00
Sweden: 46 8 587 05 600

3Com Southern Africa
27 11 807 4397

3Com Switzerland
41 844 833 933

3Com UK Ltd.
Edinburgh: 44 131 240 2900
Ireland: 353 1 820 7077
Manchester: 44 161 873 7717
Marlow: 44 1628 897000

Data Compression
ITU-T V.42 bis
MNP 5

Compatibility
ITU-T V.90 at 56 Kbps*
x2 technology at up to 56 Kbps*
ITU-T V.34 at 33.6 Kbps, 31.2 Kbps, 28.8 Kbps and slower speeds
V.FC at 28.8 Kbps
V.32terbo at 19.2 Kbps
ITU-T V.32 bis at 14.4 and 12 Kbps; 9600; 7200 and 4800 bps
(symmetrical and asymmetrical full duplex)
ITU-T V.32 at 9600 and 4800 bps
ITU-T V.22 bis at 2400 bps
ITU-T V.22 at 1200 bps
ITU-T V.32 at 1200/75 bps
ITU-T V.21 at 300 bps
Bell 208B at 4800 bps (synchronous)
Bell 212A at 1200 bps
Bell 103 at 300 bps
QuickConnect technology
Adaptive Speed Leveling® (ASL)

Fax Compatibility
V.17 at 14,400 bps; Group III; TIA/EIA Class 1, and TIA/EIA 592 Class 2.0
Call detection automatically switches between data and fax calls

Symmetrical or Full Duplex Operation
Efficient 2-way transfers for full duplex protocols and instantaneous response for interactive applications

Synchronous Transmission
From 1200 bps to 28.8 Kbps for communication with mainframes, bridges, routers or other synchronous devices

Cellular Support (optional)
MNP10EC
V.42ETC

T1 Features
Telco T1 interface via T1 application card
Modem initialization string and ANI/DNIS code storage (3 sets)
DS0 busy out
ANI/DNIS code dependent modem configuration
Supports ground start and loop start supervision and E and M, Type 2
Supports MF and DTMF addressing

Physical Dimensions
Application Card: 12.45 in. x 6.4 in.
Application Card: 4.85 in. x 6.4 in.

Power Requirements
1.5A @ 5VDC
0.1A @ 12VDC
8.7 watts
25 BTUs

Dual PRI Card

Primary Rate Interface Compliance
Compliant to AT&T technical publication TR41459 and compatible with AT&T ISDN PRI services per AT&T Laboratories testing
ISDN data link layer ITU-T Q.921
ISDN call control signaling ITU-T Q.931/I.451
Provides ANI and DNIS digits via Q.931 D-channel signaling
Supports NonFacility Associated Signaling (NFAS)

Central Office Switch Types Supported
AT&T 4ESS Custom
AT&T 5ESS Custom
Northern Telecom DMS-100 Standard
Northern Telecom DMS-250
INS 1500
National ISDN 2 (NI2)

Digital Data Compatibility
For end-to-end transmission over ISDN
ITU-T V.120/I.462
ITU-T V.110/I.463
Sync PPP (RFC 1717)

T1 Interface
Metallic interface per ANSI T1.403
CSU to T1 per AT&T Pub 62411
PRI interface per ANSI T1.408
D4 or ESF frame formats
B8ZS line coding
Integral CSU
- Auto equalization for data and clock recovery
- Range = 36dB at 772 Khz (6000 feet 24 AWG TP wire)

Supports local and remote loopbacks

LED Indicators
Run/Fail, Carrier, Loopback and Alarm status
Power/Heat
5 watts per card set/17 BTUs

Operating Environment
Temperature: 32°-104° F (0°-40° C)
Humidity: 0-95% (non-condensing)
Non-condensing

Physical Interfaces
RJ-48C T1/PRI connectors for span1 and span2
RJ-45 RS-232 connector for local management console
1/8 in. bantam monitor jacks

T1 Interface

Metallic interface per ANSI T1.403
CSU to T1 per ATT pub 62411
D4 or ESF frame formats
B8ZS line coding
Integral CSU
- Auto equalization for data and clock recovery
- Range = 36dB at 772 Khz (6000 feet 24 AWG TP wire)

Configurable E&M type II signal support including:
- Wink start or immediate start
- Answer Supervision
- Feature Group B, Feature Group D, and others
- DNIS and ANI address signaling

Supports ground start and loop start supervision
Supports MF and DTMF addressing
Supports local and remote loopbacks

Physical Interfaces
RJ48C connectors for span 1 and span 2 on T1 NIC
Bantam monitor jacks for span lines 1 and 2 on T1 NIC
RJ45 for local management console

LED Indicators
Run/Fail, Carrier, Loopback, and Alarm status

Power/Heat
5 watts per card set/17 BTUs

Operating Environment
Temperature: 32°-104° F (0°-40° C)
Humidity: 0-95% (non-condensing)

* Capable of receiving downloads at up to 56 Kbps and sending at up to 31.2 Kbps. 56K download capability requires compatible phone line and provider/host server equipment. Actual download speeds may be lower than 56 Kbps due to telecommunications regulations, varying line conditions, and other factors. This product complies with the 56K V.90 ITU standard and x2 technology. ITU standard ratification is expected in September 1998. See www.3com.com/56k for details.

**Visit www.3com.com for availability of drivers supporting second processor.

*** For our customers with existing x2 technology (and products upgraded to x2 technology), we guarantee a free upgrade to the V.90 standard. You must claim your free upgrade by December 31, 1998. See www.3com.com/56k for details.

To learn more about 3Com products and services, visit our World Wide Web site at http://www.3com.com.

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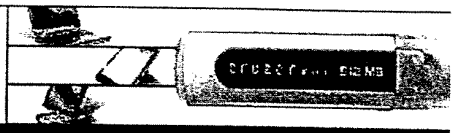

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Read product information for the 3Com CommWorks Total Control HiPer Access Router Card (002106-01)

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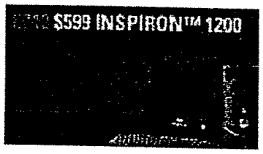

The HiPer Access Router Card Set is a complete solution for Internet service providers, telcos and large corporate networks that require high-performance routing technology. The HiPer Access Router Card is part of the HiPer Access System and is used in conjunction with HiPer DSP Cards to form a complete solution for unparalleled remote access performance. The HiPer Access Router Card supports and routes 336 analog or ISDN dial-up calls via T1 or T1-PRI connections, or 420 analog or ISDN dial-up calls via E1 or E1-PRI connections. Two HiPer

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Access Router Cards may be configured in a single Total Control HiPer Access System to provide statistical redundancy for increased routing performance.

Standards and Protocols

Management Protocol	SNMP

Miscellaneous

MPN	002106-01
Product ID	20194173

Additional resources

Router Technology
Free e-Book download: "Architecting Next-Generation Networks"
www.gobroadcom.com

Routers at Amazon.com
' ow prices and huge selection. Qualified orders over $25 ship free
.mazon.com/tools

Broadband Router
Broadband Networking at Dell
www.dell4me.com

Hubs, Routers, & Switches
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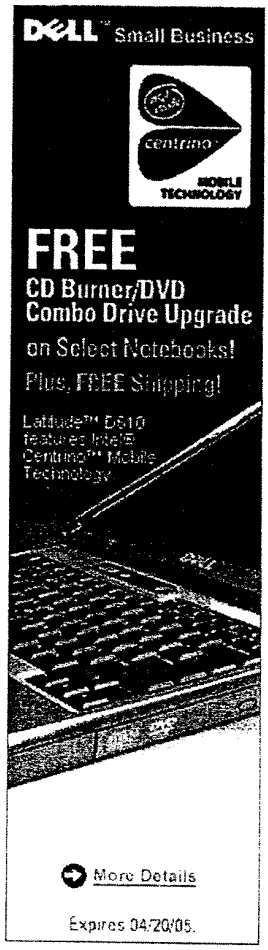

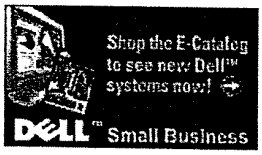

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Read product information for the 3Com Total Control 1000 HiPer DSP Card Set (002092-00) Modem

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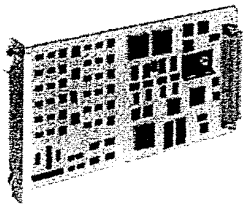

The advanced design of the HiPer DSP card set enables multiple modem sessions, ISDN processing, voice-codecs, and PPP co-processing on a single DSP (digital signal processor)-delivering a high level of functionality in a small space. The card set can process a T1/E1 spans worth of channels (24 or 30 channels respectively) while occupying just one platform slot. In a fully populated Total Control 1000 platform, the HiPer DSP card set can handle up to 336 calls via T1 and up to 420 calls via E1. Unlike a simple modem card, the HiPer DSP card set features a fully reprogrammable digital signal

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processing engine that lets administrators reconfigure the system to implement new technologies and applications such as voice-over-IP. The card set supports a full range of trunk and communications standards, including many variations of CAS/PRI 56K V.90, 3Com x2 technology, and all of the most common ITU-T and Bell communications standards and rates (including V.34, V.32terbo, V.32, and V.32bis...

Key Features

Type	ISDN Terminal Adapter
Connectivity Technology	Wired
Platform	PC

Protocols

Analog Modulation	ITU V.34, ITU V.32bis, ITU V.32, ITU V.17, ITU V.22bis, ITU V.22, ITU V.90, ITU V.21, Bell 212A, Bell 103, Bell 212, Bell 208B
Error Correction	ITU V.42, MNP-4, MNP-3, MNP-2
Data Compression	ITU V.42bis, MNP-5
Digital Signaling	ISDN PRI

Other Features

56K Technology	V.90, X2

Warranty

Warranty	2 Years

Miscellaneous

Package Qty.	1
MPN	002092-00
Product ID	20162023

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EXHIBIT 16

THE INDEPENDENT GUIDE TO TECHNOLOGY
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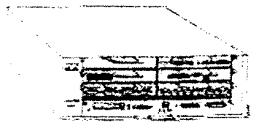
Read product information for the Cisco 7206 VXR Router (C7206VXR/400/2FE)



Enterprise and service provider customers continue to drive the need for optimizing operational and management costs, simplifying network management and increasing revenue opportunities. The Cisco 7200 addresses these requirements by collapsing functions previously performed by separate devices into a single, cost-effective platform. Through functional integration, the Cisco 7200 high-performance multifunction platform provides a single, cost-effective platform.The Cisco 7200 series delivers exceptional price/performance to meet the requirements of both enterprise and service providers. With its combination of

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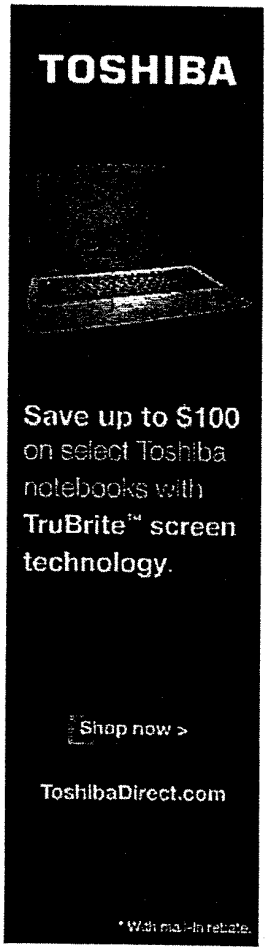
scalable performance, density, and low per-port pricing, the Cisco 7200 allows network-layer capabilities to be extended to a much wider range of network configurations and environments. Customers can now gain the advantages of high-performance network-layer switching and services, including security, QoS, and traffic management to more locations throughout the network.Th...

Standards and Protocols	
Management Protocol	SNMP, Telnet
Memory	
Installed RAM	128 MB
Installed Flash Memory	48 MB
Dimensions	
Width	16.82 in.
Depth	17.02 in.
Height	5.24 in.
Weight	50.05 lb.
Miscellaneous	
MPN	C7206VXR/400/2FE
Product ID	20218090



> Compare prices on the Cisco 7206 VXR Router (C7206VXR/400/2FE)

Additional resources

Routers
Secure & assured routing solutions for large scale networks. Reliable.
www.juniper.net

Routers at Amazon.com
ow prices and huge selection. Qualified orders over $25 ship free
Amazon.com/tools

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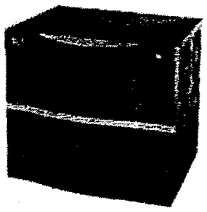

The MAX TNT multiprotocol WAN access switch enables carriers, ISPs, corporations, and major network providers to offer a variety of access services such as analog, ISDN, leased T1/E1, and frame relay. Because the MAX TNT is the highest-density product in its class, it dramatically reduces rack space requirements while driving down the price per port.The MAX TNT has a scalable, modular card and backplane architecture that provides intelligent access for applications to global network services. The modular card system lets users design a solution that

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satisfies the specific application and bandwidth requirements of any customer.

Key Features	
Connectivity	Cable
Platform	PC
Protocols	
Data Link Protocol	Fast Ethernet, Ethernet
Remote Management Protocol	SNMP
Transport Protocol	TCP/IP
Other Features	
Moduls Qty.	0
Package Qty.	1
Dimensions	
Width	17.41 in.
Depth	11.5 in.
Height	14.03 in.
Weight	130.1 lb.
Miscellaneous	
MPN	TNT-2DC-H
Product ID	20205182

Additional resources

ISPs: Upgrade to V.92
Get a new V.92 and V.44 RAS Patton buys your old RAS for cash!
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MyWebExPC (Official Site)
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